

The Claims

What is claimed is:

1. A device for the selective control of a liquid flow from an external body of
5 liquid or liquid and solid separation comprising:
a container having an inlet for the intake of a liquid into the container from an external
body of liquid, an outlet for the discharge of the liquid from the container, and a closed
bottom surface;
a float buoyantly positioned within the container and configured to rise and fall in
10 response to the level of liquid within the container; and
a valve positioned inside the container in association with the outlet, said valve
coupled to the float such that the valve opens when the float rises above a preselected height
within the container and the valve closes when the float falls to the preselected height within
the container, wherein the distance between the float and the valve when the float is
15 positioned at the preselected height determines a height of liquid required to open the valve..
2. The device of claim 1, wherein the inlet comprises an inlet pipe and the outlet
comprises an outlet pipe, with the inlet and outlet pipes being positioned in the same plane;
and the valve is positioned at a height that is spaced from the closed bottom surface of the
20 container.
3. The device of claim 1, wherein the inlet has a dimension and the outlet has a
dimension, and the inlet dimension is smaller than the outlet dimension.
- 25 4. The device of claim 1, wherein the container is a riser and the valve is a flapper
valve.
5. The device of claim 4, wherein the flapper valve comprises a rigid plate
adjoined to a flexible seal, with the rigid plate being coupled to the float.

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6. The device of claim 1, wherein the float comprises a closed-cell foam enclosed in a plastic outer shell.

7. The device of claim 6, wherein a linkage is positioned between the float and
5 the valve and the linkage is adjustable in length.

8. The device of claim 7, wherein the linkage between the float and the valve is at least one of a flexible member and a rigid member, said flexible or rigid member including a cord, a string, a bar, and a chain, said bar including a plurality of adjustment holes positioned
10 at spaced locations along the length of the bar.

9. The device of claim 4, wherein the flapper valve includes a hinge at one end and is coupled to the float at the other end such that the flapper valve opens around the hinge when the float rises above the preselected height, with the hinge being one of a living hinge or
15 a mechanical hinge.

10. The device of claim 4, wherein the flapper valve is oriented in a recumbent position within the riser.

11. The device of claim 10, wherein the recumbent position ranges from horizontal to angled at about a 60° angle relative to horizontal.

12. The device of claim 11, wherein the recumbent position is about 45° relative to the horizontal.

13. The device of claim 10, wherein liquid flows into the outlet in a direction that is substantially perpendicular to a movement direction of the flapper valve.

14. The device of claim 1, further comprising a vortex plate positioned in the
30 outlet.

15. The device of claim 1, wherein the container is a catch basin having an open top and the inlet comprises the open top.

5 16. The device of claim 15, further comprising a removable grate structure positioned over the open top.

17. The device of claim 1, wherein the container, inlet and outlet are molded as one piece.

10 18. The device of claim 1, wherein the container, inlet, and outlet are comprised of one of plastic, concrete, fiberglass, or metal.

15 19. The device of claim 1, wherein the container comprises a corrugated pipe having a base structure forming the bottom surface and an open top end, and the inlet and outlet both comprise a conduit, each of which is affixed to the corrugated pipe of the container, with the open top end of the container being covered by a cap.

20 20. The device of claim 1, wherein the container and valve are together configured to separate solids from liquids within the container.

21. The device of claim 1, wherein the container and valve are together configured to separate liquids and solids within the container from a base liquid, with liquids and solids having a greater density than a density of the base liquid sinking to the bottom surface of the container and liquids and solids having a lesser density than the density of the base liquid floating on top of the base liquid.

22. A flow control device comprising:
a riser having an inlet for the intake of a fluid, an outlet for the exit of a fluid, and a closed bottom surface;
30 a float positioned inside the riser and configured to travel in response to a fluid level in the riser; and

a valve positioned inside the riser coupled to the float, said valve being movably responsive to the travel of the float, wherein the valve is coupled to the outlet and is oriented at an angle relative to horizontal.

5 23. The device of claim 22, wherein the angle is about 45° relative to horizontal.

 24. The device of claim 22, further comprising a linkage positioned between the float and the valve; and

 a linkage latching mechanism for fixing the length of the linkage between the
10 float and the valve.

 25. The device of claim 24, further comprising a means for raising the float height.

 26. A method for controlling liquid flow from an external body of liquid
15 comprising:

 providing a container having an inlet and an outlet within the container;

 disposing a valve between the inlet and the outlet within the container;

 coupling a float to the valve, said float being buoyantly responsive to liquid that enters
the container such that the valve opens when the float rises above a preselected height within
20 the container and the valve closes when the float sinks to the preselected height within the
container, wherein the distance between the float and the valve when the float is positioned at
the first height determines a height of liquid required to open the valve.

 27. A method for separating solids received from an external body of liquid that
25 includes solids and liquids comprising:

 the method of claim 26; and

 positioning a height of the valve such that at least some of the solids sink to a
position below the height of the valve, wherein when the valve is opened, liquids exit into the
outlet.

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28. A method of separating liquids having a first density and a second density that are disposed together in a liquid received from an external body of liquid comprising:

the method of claim 26; and

5 positioning the height of the valve such that liquids having a first density sink to a level within the container that is below the valve and liquids having a second density rise to a level that allows them to exit into the outlet through the valve when the valve is opened.

29. The method of claim 27, wherein the liquid received from an external body of liquid further comprises a liquid having a third density, and further comprising positioning the
10 height of the valve such that the liquid having a third density rises to a level above the valve such that when the valve is opened, the liquid having a second density exits the container while the liquids having a first and third density remain in the container.